

Graphology and Cattell's 16PF Traits Matrix (HoloCatT Matrix)

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Abstract

Graphology has been considered to be useful in identifying a person's personality in some European countries. However, the International Graphonomic Society recommended that scientific evidence is also needed to associate the usage of graphology to identify these traits. The objective of this research is to identify the relationship between the meaning of selected graphology features and Cattell's 16PF. A set of questionnaires have been distributed to personologists in order for them to verify the relationship between the meaning of five main features in graphology namely proportion, caliber, baseline, slanting and space with the 16 personality factors in Cattell's 16PF. From the findings, 80.9% of the relation was positively confirmed by the personologist, this shows that the selected graphology features and Cattell's 16PF do have some relations. As a result, a matrix table of graphology and Cattell's 16PF is obtained.

Key-Words: - Personality Traits, Traits Approach, Graphology, Cattell's 16PF

1. Introduction

Writing is a physical process as our brain sends signals to the arms and finger to move accordingly. During the process of writing the intention to write was shaped deep within the creative mind thus making the handwriting an expressive gesture that represents the authors mind behind the writings. Graphology can be used to interpret the writers mind from the writer's handwriting that relates to the writer's personality. According to Paterson [1], graphology is a useful tool as an aid to personnel selection for both the employer and employee. The author also mentioned that graphology can be applied as a helpful tool for document examiner in crime investigation. Since there are very low possibilities that people should have the same handwriting [2], different writer will have different personality interpretation from others.

This research will cover several features that can be identified in graphology. These features are caliber,

proportion, space, baseline and slanting [3]. There are also several attempts by other researchers to find the validity of the personality result from handwriting graphology analysis by comparing it with the personality report obtained from personality questionnaires [4, 5, 6]. However, most of the attempts show graphology produces inadequate results, [7] indicating that this may caused by the influence of the handwriting content.

Therefore, the aim of this research is to identify the association between the personality description of the identified graphology features and Cattell's 16 personality factors (Cattell's 16PF). A relational matrix of graphology features and personality traits call the HoloCatT Matrix would be introduced at the end of this research. This research can be use as a source of additional information about the personality candidates for any job placement. It is hoped some day, this research can be utilized as a reference for further studies in those fields.

In section 2, the personality identification technique including graphology and personality traits will be discussed in general. The approach and method that were employed in this research will be explained in section 3. Section 4 would highlight the findings and in section 5 conclusions of the research would be discussed.

2. Personality Identification

The most common methods of obtaining one's personality are by interviews, observation, clinical session and questionnaire. These methods are usually used by personologist. However, graphology is another alternative that can be use to identify a person's personality. In some countries such as France and Europe, graphology has become popular method in personality identification [4, 8].

2.1. Graphology

Graphology is a method of recognizing a person's personality based on the person's handwriting or the person's signature. It has been applied in various fields such as psychology, education, medicine,

criminal detection, marriage guidance, commerce and recruitment [8]. There are also claims been made that graphology has the ability to be used in personnel selection decision in business [9]. However, the application of graphology as personnel selection tool has been debated by many researchers. There are evidences that shows the decisions resulted from graphology analysis only has a marginal relation with the supervisor ratings of actual on-the-job performance [7]. However, the practice of graphology is still being continued through out the world. Therefore, in 2003, the International Graphonomic Society recommends that those who are employing graphology analysis for personnel selection, recommended to be supported by a valid personality test [7].

2.1.1. Graphology Features. There are several graphology features that are taken into consideration in this research [3]. The graphology features are as follows:-

Caliber: Caliber defines the signature sizes, a signature may be identified as large, small or average.

Proportion: How signature varies in shapes will be determine using proportion. A signature may be proportionate, or disproportionate. It also defines which area of zones the signature dominates, whether it is the upper, lower or middle zone.

Space: Spacing can be clearly identified, as some signatures do have spacing.

Baseline: Signature alignment to baseline can also be identified by analyzing the angle of the signature.

Slanting: Each stroke of a signature may indicate where it slants. A signature may have a reclined slant or an inclined slant.

Each feature holds its own meaning. However, combining all the features together, a person's personality can be described.

2.2. Personality Approach

Scientifically there are six personality approaches that can be used to identify a person's personality [10, 11, 12, 13]. These approaches are *psychoanalytic approach*, *traits approach*, *biological approach*, *humanistic approach*, *behavioral/social learning approach* and *cognitive approach*. Different approach gives different explanation on our source of consistent behavior pattern and intrapersonal process. However, combining several approaches to explain about a person's personality is not advisable because it would appear entirely incompatible [10]. Therefore, according to Burger [10], most people who studied personality often align themselves with one of the six approaches. For the purpose of this research, traits approach is being selected due to its capability in describing a basic dimension of personality. Further explanation is in the following phase.

2.3. Traits Approach

Traits approach has been widely accepted in personality psychology [10]. It has been used in nearly every approach, as well as psychology from many other fields of psychology as a tool of measurement for the personologists' work [10]. According to Cloninger [11], a trait can be described as a theoretical construct describing a basic dimension of personality. Burger [10] also emphasized that the dimension of personality can be used to categorized people according to the degree to which they manifest a particular characteristic. It was build based on two assumptions. The assumptions are, personality characteristics are relatively stable over time and also personality characteristics are stable across situation. The traits approach place less emphasis on identifying the mechanisms' underlying behaviour. This is because, there are no consensuses between psychologists whether traits should be simply described or referred to cause of behaviour [11]. Instead they want to predict how people who score within a certain segment of the trait continuum will typically behave; this concept is more approaching towards describing personality [10].

2.4. Cattell's 16PF

There are two theories in the traits approach [11] namely *dynamic emphasis* and *descriptive emphasis*. The *descriptive emphasis* is much more popular and well understood compared to the *dynamic emphasis* [11]. According to Cloninger [11], the *descriptive emphasis* is build by Raymond Cattell. He focused on the descriptive issues of individual differences. He refined the gross description of people, which language provides, using sophisticated statistical procedures to determine the fundamental ways in which people differ from one another, and he developed psychological test to measure these differences. He has identified 16 personality dimensions. He regards traits as the unit of personality that have predictive value and he defined it as relatively permanent reaction tendencies that are the basic units of the personality [12]. To Cattell, traits were abstract concepts, conceptual tools useful for predictive purpose but not necessarily corresponding to anything within a person; traits had no specific physical reality [11]. Therefore, Cattell has nine ways to classify the traits [12]. One of them is the *source traits*. The 16 dimensions have been identified as a *source trait*, which is the underlying factor that controls the variable in the surface cluster [13]. It is also known as single or unitary personality factor, stable, permanent element of our behaviour [12].

2.5. Attempts to Relate Graphology Features and Personality Traits

Over the years, researchers have shown an interest in the area of personality theory and graphology. Most of them have made comparison between the personality description made by the graphologist based on their respondent's handwriting and the personality descriptions based on the analysis obtain from the questionnaire of the relevant personality theory [4, 5, 6]. However, most of the results of the comparisons show that there are no robust relationship between personality theories and graphology analysis [4, 5, 6]. According to Simner and Goffin [7], this may due to the content of the handwriting that may possibly influence the judgement of the graphologist.

3. Research Approach

The difference between this research and other research endeavor is to seek the relationship between graphology and personality traits are explained through Figure 1 and Figure 2.

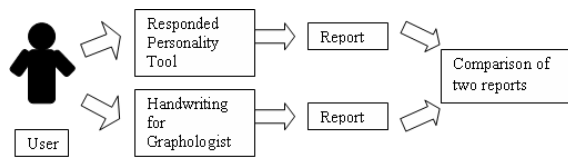


Figure 1: Research approach of relationship identification between graphology and personality traits from previous research

Figure 1 shows the existing research approach that was done by other researcher in identifying graphology and personality traits relationship. This approach focuses on comparison between personality reports that has been obtained using personality tool and personality report that has been obtained from graphologist.

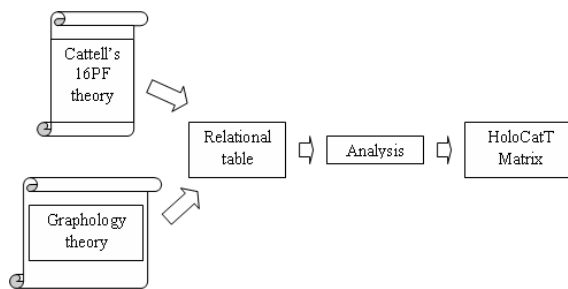


Figure 2: Research approach of this research

Whereas, in this research, graphology theory and personality theory is reviewed and linked in a relational table. Then, the table is analyzed and thus, a HoloCatT Matrix is introduced as shown in Figure 2. Detail explanation of the research methodology is discussed in the next phase.

3.1. Research Methodology

There are several phases involved in this research as it involves validation of the acquired knowledge. Figure 3 shows how the research is being conducted. All the information between graphology features meaning and Cattell's 16PF trait measures are collected and reviewed. Then each item from both graphology and Cattell's 16PF that have similar meaning is associated. The associations of the personality traits are listed in a systematic manner. Then, the associations are evaluated by experts through questionnaire. From the obtained experts' feedbacks a relational matrix is developed. The discussion of each phase would be described in depth further.

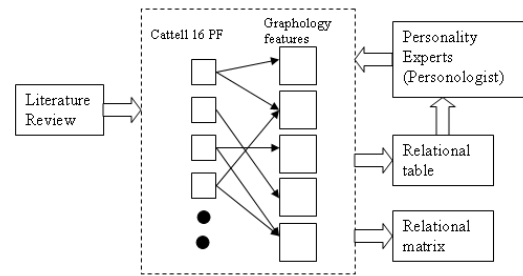


Figure 3: Methodology

3.2. Questionnaire Design

As soon as the personality description collection from graphology and Cattell's 16 PF associations is completed, a table is obtained and a questionnaire is designed to obtain personologist opinion upon the validity of the association. The design of the questionnaire is done in two phases. In the first phase (pilot design of questionnaire), an initial design of questionnaire is designed. The initial questionnaire is developed in order to test the reliability of the questionnaire itself to project the association of graphology and Cattell's 16PF. In the pilot design, the personality description for each graphology features is being allocated for each question. For each question, the personologist needs to tick which Cattell's 16 personality factor that they think relates to the stated description. If they think that the personality factor is indeed related to the personality description, then they will tick the YES box but, if they think that the particular personality factor is not related, then, they will tick the NO box. The last page of the questionnaire, there are extra questions to test the reliability of the research instrument, in this case the questionnaire itself.

After receiving feedback from experts, the questionnaire was refine for better understanding and analysis for the expert to evaluate the association. In the new refined questionnaire, the personality description of each features from graphology has been

rephrased with the help of an expert to make it look liked the personality description that belongs to a person. This time, the personologist is given only the personality factor from Cattell's 16 PF that should relate to the person's personality description. The personologist need to tick the YES box if he/she thinks that the choice(s) of personality factor(s) that was given is related and leave it if he/she thinks it is not related. If the personologist thinks the personality factor is related, he/she needs to tick whether the personality factor is HIGH or LOW according to the person's personality. If the personologist thinks there are other personality factors that related to the person's personality, he/she needs to state it too. There are 24 questions in the questionnaire and there are 47 relations within the questions. At the last page of the questionnaire, there are also extra questions being added to test the reliability of the research instrument, in this case the questionnaire itself.

3.3. Expert Profile

Experts chosen to verify the relationship of graphology and Cattell's 16PF were local experts and were identified by the snow ball method. These experts were chosen according to their familiarity with Cattell's 16PF. This research has successfully identified three local experts for the initial questionnaire and another three local experts for the actual questionnaire.

3.4. Questionnaire Reliability Analysis

The aim of the initial questionnaire analysis was, to find out whether the questionnaire's design is able to extract the experts' knowledge. From the evaluation, 66.67% of the experts wrote that the questions and the representation of the answers needed to be reconstructed. Therefore, a second revised questionnaire is created.

From the analysis of the revised questionnaire, all of the experts agreed that the selected features from graphology and personality factor(s) from Cattell's 16PF do have associated meaning and the degree for this findings showed that the association between Cattell's 16PF and graphology is adequate. Thus, the feedback from the revised questionnaire can be used to find the strength of the association of graphology and Cattell's 16PF.

3.5. The Relational Table Strength Analysis

To identify the strength of the association that has been developed earlier, this research adapted the concept of the scoring technique in [14]. As mentioned in questionnaire design section, each question represents one selected graphology features and the personologist is given only the personality factor from Cattell's 16 PF that is related to the person's personality description. If the personologist has given

an affirmation to the personality factor and its degree, and it is exactly the same as relational table developed earlier, then, the score for that particular personality factor is 1. If the affirmation is partially equal, for example; the expert agreed that the personality factor is related but noted the different degree in the relational table, then, the score is 0. If the affirmation is totally different, then, the score is also 0. Table 1 shows the scoring for question 2, where R1, R2 and R3 are the experts.

Table 1: Score for question 2

Respondent		Score		
		R1	R2	R3
Question	Relation			
2	1	0	1	1
	2	0	1	1
	3	0	0	1

The relation in the relational table is considered to be acceptable by the experts if at least one out of all experts gives affirmation identical to the relation that has been identified earlier. Therefore, if at least one out of all experts give affirmative respond, then, the relation is being weighted as 1, else, the relation is weighted as 0. Table 2 represents the weighted relation for question 2, where R1, R2 and R3 are the experts.

From the weighted relation, it is found that, out of 47 relations in the relational table, 80.9% were given positive affirmation by at least one out of all experts. This means that the relational table is adequately correct according to the expert. Thus, this has lead to the development of the HoloCatT Matrix as shown in Table 3.

4. Findings

According to the analysis and feedback from the personologist, they believe that there are other personality factor(s) from Cattell's 16PF that relates to the personality description aside from the recommended personality factor(s) that was suggested in the relational table.

Table 2: Weighted relation

Respondent		Score			
		R1	R2	R3	weight
Question	Relation				
2	1	0	1	1	1
	2	0	1	1	1
	3	0	0	1	1

Therefore, using the same technique that has been employed before, the research has produced the HoloCatT Matrix of the selected graphology features and Cattell's 16PF as shown in Table 3. This matrix

shows the corresponding meaning of a graphology feature that is associated with one or more Cattell's 16PF traits.

5. Conclusion and future works

From the research findings it can be concluded that, the selected features from graphology do have a relationship with personality factor(s) from Cattell's 16PF. However, there is more room for enhancement, such as in the development of the relational table and up coming future research regarding the application of the relational table using information technology as a tool in personal assessment. It is hoped that in the near future, more effort will be done in expanding this research.

6. Acknowledgement

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Table 3: The HoloCatT Matrix

Cattell's 16PF	Features	Cattell's 16PF																					
		small	medium	large	small	medium	large	small	medium	large	small	medium	large	Left	vertical	Right	rising	straight	falling	narrow	Well balance	wide	
Tension	H																						
	L																	*					
Perfectionism	H																						
	L																						
Self-Reliance	H																						
	L																						
Openness to Change	H																						
	L																						
Apprehension	H																						
	L																						
Privateness	H																						
	L																						
Abstractedness	H		*																				
	L		*																				
Vigilance	H																						
	L																						
Sensitivity	H																						
	L																						
Social Boldness	H																						
	L																						
Rule-Consciousness	H		*																				
	L		*																				
Liveliness	H																						
	L																						
Dominance	H																						
	L																						
Emotional Stability	H																						
	L																						
Reasoning	H		*																				
	L		*																				
Warmth	H																						
	L																						

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* - The relation for this features has been removed due to its weight equal to 0